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DEFENSE MAPPING AGENCY
BUILDING 56, U.S. NAVAL OBSERVATORY
WASHINGTON, D.C. 20305

COMIREX Mapping, Charting and Geodesy Working Group

Minutes of the Meeting Held at

Headquarters, Defense Mapping Agency
Building 56, U. S. Naval Observatory
Washington, DC 20305

0930-1115 Hours, 25 August 1983

Principals

Mr. Daniel W. Lockard, Chairman (DMA)
Mr. Joseph Parrinello, Executive Secretary (DMA)
Mr. Milton J. Lohr, Jr., DMA Member
Dr. Joseph A. Baclawski, COMIREX
[redacted] DIA/DC-5 50X1
[redacted] 50X1 50X1
LTC Roger M. Ryan, HQ DA/DAMI-ISP
MAJ Robert F. Kirby, HQ DA/DAMI-ISP
Mr. Michael D. O'Byrne, HQ DA/DAMI-ISP
LT Charles Roberts, NISC
Lt Col Phillip D. Wilder, AFIS/INTB
Mr. Constantine N. Pappas, AFIS/INTB
[redacted] 50X1
Mr. Frank P. Lozupone, DMAHTC/SDI
Mr. Robert P. Haddad, DMAAC/PPGG

Observers/Briefers

Brig Gen William B. Webb, USAF, Deputy Director, DMA
RADM L. S. Severance, Jr., USN, DMA/PR
Mr. William P. Durbin, DMA/PR
Mr. Allen E. Anderson, DMA/PP
Mr. Thomas O. Seppelin, DMA/ADD/P&D
Dr. Jerome Kurkowski, DMA/PRR
Mr. William H. Heidbreder, DMAAC/STA
Mr. B. Louis Decker, DMAAC/STT
Mrs. Shirley A. Sostman, DMA/PPS

1. (U) Mr. Lockard opened the meeting with several general announcements:

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[redacted]

a. A review of the proposed agenda was offered for open discussion prior to the presentations. A copy of the agenda is at Enclosure 1.

b. Attendees were asked to introduce themselves and state what organization they represent.

2. (TS/BTK) Highlights of the meeting:

a. WGS-84: World Geodetic System-84 (WGS-84) will be available in December 1984. The accuracy for Datum NAD 27, ED, TO, and AGD for X, Y, and Z would be in the three meter range, but it would not be as accurate for USSR. The implementation date for DMA to produce MC&G Data/Products with this new datum has not been determined. Copies of the vugraphs for this briefing are at Enclosure 2.

b. Metric Assessment: The diagnostic and engineering evaluation of

[redacted] 50X1

The sample of seven has proven to be too small and further tests and evaluations are underway to use a sample of 50 as expressed in the expanded T&E graphic. Copies of the vugraphs for this briefing are at Enclosure 3.

c. DMA Secure Data Communications Network (SDCN): Preparation is underway for the installation of the SDCN; however, there are some delays in obtaining all the components required. The completion date is scheduled for October 1983. Copies of vugraphs for this briefing are at Enclosure 4. (Additional delays have now changed the completion date to December 1983.)

[redacted] 50X1

[redacted] 50X1

[redacted] 50X1

a. Discussion: An issue was raised related to DMA's need for [redacted] 50X1

DMA was the only vote for using [redacted] percent 50X1
of the resources; the rest of the COMIREX members voted for [redacted] percent.
Mr. O'Byrne, Army, stated that DMA's "priority one" requirements are so large that the credibility of it was weakened so much that the voting members opted for an allocation of [redacted] percent film resource. Also, if 50X1
DMA has such a need for priority emphasis of requirements, it should be implemented by Area Target Category (ACAT) instead of asking for requirements by priorities which cover so much area. It was brought out that DMA has an allocated number of ACATs [redacted] which makes it impossible 50X1
to define our requirements in small prioritized geographic areas. However, the point was well taken and it was felt that there are other methods to emphasize a geographic area of high interest/priority.

The Deputy Director, DMA, indicated his interest in being informed of the outcome of the recommendations that will go to COMIREX and the support received from the MC&GWG members related to second half mission planning.

3. (U) The meeting was adjourned at 1115 hours. The next MC&G Working Group meeting will be held in October after the assessment of [redacted] 50X1
been completed.

Daniel W. Lockard

DANIEL W. LOCKARD
Chairman, MC&G Working Group

7 Enclosures
1. Agenda (S/TK)
2. WGS-84 Briefing Vugraphs (U)
3. Metric Pan Camera System
   Briefing Vugraphs (TS/TK)
4. DMA SDCN Briefing Vugraphs (FOUO)

[redacted] 50X1

[redacted]

BYE-047565 [redacted] 50X1

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DISTRIBUTION:

Cy 1	DMA/PPS (Mr. Daniel W. Lockard)
Cy 2	CIA Member [redacted] 50X1
Cy 3	Ch/IPS (Mr. Robert Kropf)
Cy 4	Ch/OPSCOM (Mr. John McLauchlin)
Cy 5	BCO DIA [redacted] 50X1
Cy 6	BCO Army (LTC Roger M. Ryan/DAMI-ISP)
Cy 7	BCO Navy (CDR Geoffrey A. Whiting/OP-952)
Cy 8	BCO Air Force (Lt Col Phillip D. Wilder/AFIS/INTB)
Cy 9	BCO Marine Corps (1STLT Roy V. Wallis/CMC/INTM)
Cy 10	BCO NISC (Mr. William J. Flexsenhar/CODE 71)
Cy 11	BCO NSA [redacted] 50X1
Cy 12	BCO State (Mr. Peter M. Modley/INR)
Cy 13	BCO NPIC (Mr. Todd Augustine)
Cy 14	Ch/COMIREX (Dr. Joseph A. Baclawski)
Cy 15	NRO [redacted] 50X1
Cy 16	BCO DMAHTC (Mr. Frank Lozupone/SDI)
Cy 17	BCO DMAAC (Mr. Robert P. Haddad/PPGG)
Cy 18	BCO USGS (Mr. Roy Fordham)
Cy 19	BCO IC Registry
Cy 20	OD-4 (Don Stokes)
Cy 21	BCO DMA File

[redacted]

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MC&G WORKING GROUP MEETING

25 AUGUST 1983

AGENDA

CHAIRMAN'S REMARKS	MR. DANIEL W. LOCKARD
INTRODUCTION	BRIGADIER GENERAL WILLIAM B. WEBB, USAF
WGS-84 IMPLEMENTATION PLAN	MR. B. LOUIS DECKER
[redacted]	MR. WILLIAM H. HEIDBREDER 50X1
DMA SECURE DATA COMMUNICATIONS NETWORK STATUS	MRS. SHIRLEY A. SOSTMAN
[redacted]	MRS. SHIRLEY A. SOSTMAN 50X1
	MR. JOSEPH PARRINELLO
[redacted]	MR. DANIEL W. LOCKARD

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Enclosure 1

HANDLE VIA
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A
WORLD GEODETIC SYSTEM
(WGS)

WORLD GEODETIC SYSTEM
DEFINED BY EIGHT MAJOR COMPONENTS

1. EARTH-CENTERED, EARTH-FIXED COORDINATE SYSTEM
2. EARTH-CENTERED, ROTATIONAL, EQUIPOTENTIAL ELLIPSOID
3. ELLIPSOIDAL GRAVITY FORMULA
4. EARTH GRAVITATIONAL MODEL(S)
5. GEOID REPRESENTATION(S)
6. LOCAL GEODETIC-TO-WGS DATUM TRANSFORMATION PARAMETERS, FORMULAS
7. ACCURACY VALUES (WGS PARAMETERS, DATA, PRODUCTS)
8. COLLECTION OF FORMULAS, PROCEDURES, DATA TAPES

WORLD GEODETIC SYSTEM

- PURPOSE/ROLE - PROVIDE A SINGLE, CONSISTENT, ACCURATE REFERENCE FOR POSITIONAL, DIGITAL, MAPPING, CHARTING, GRAVIMETRIC PRODUCTS PRODUCED FOR DOD BY DMA
- MUST BE APPROPRIATE FOR:
  1. POSITIONING SINGLE SITES, LARGE DATA BASES
  2. SATELLITE EPHEMERIS GENERATION, ETC.
  3. MAP, CHART PRODUCTION

FIVE DISTINCTIVE WGS FEATURES/PROPERTIES*

1. ELLIPSOID IS EARTH-CENTERED
2. ELLIPSOIDAL GRAVITY FORMULA; EARTH GRAVITATIONAL MODEL
3. ISOLATED POSITIONS CAN BE EASILY INCORPORATED
4. CAN SUPPORT OPERATIONS WORLDWIDE
5. SUITABLE FOR SUPPORTING SPACE ACTIVITIES

*THAT EXISTING LOCAL GEODETIC SYSTEMS DO NOT HAVE

WORLD GEODETIC SYSTEMS (WGSs)

WGS 60

WGS 66

WGS 72

WGS 84

15

RATIONALE FOR WGS IMPROVEMENT

MUST BE BASED ON THE FACT THAT THE PRESENT SYSTEM

EITHER CANNOT SATISFY CURRENT AND/OR FUTURE DOD ACCURACY REQUIREMENTS FOR G&G DATA

OR DOES NOT PROVIDE SUFFICIENT DATA/INFORMATION OR GEOGRAPHIC COVERAGE FOR ALL PRESENT AND/OR ANTICIPATED WEAPON SYSTEMS APPLICATIONS

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RATIONALE FOR WGS IMPROVEMENT (CONT'D)

1. THE WGS 72 EGM AND GEOID ARE OBSOLETE

2. LOCAL-TO-WGS DATUM SHIFTS OF IMPROVED ACCURACY AND GREATER GEOGRAPHIC COVERAGE THAN AVAILABLE FROM WGS 72 ARE NEEDED

3. ORIENTATION AND SCALE ERRORS ARE PRESENT IN WGS 72

4. THE EXTENSIVE INCREASE IN DOPPLER-DERIVED GEOCENTRIC POSITIONS, THE AVAILABILITY OF SATELLITE RADAR ALTIMETER DATA FOR THE OCEAN AREAS, AND THE AVAILABILITY OF NEW THEORY AND TECHNIQUES CAN BE EXPLOITED TO CORRECT EXISTING DEFICIENCIES IN WGS 72

5. SEVERAL ACTIONS AFFECTING THE PRESENT WGS ARE CURRENTLY IN-PROGRESS OR CONTEMPLATED [e.g., THE READJUSTMENT OF NAD 27 AND ED 50 (?)]

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DISCUSSION

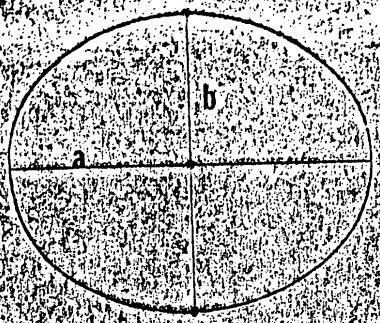
OF

WORLD GEODETIC SYSTEM 1984

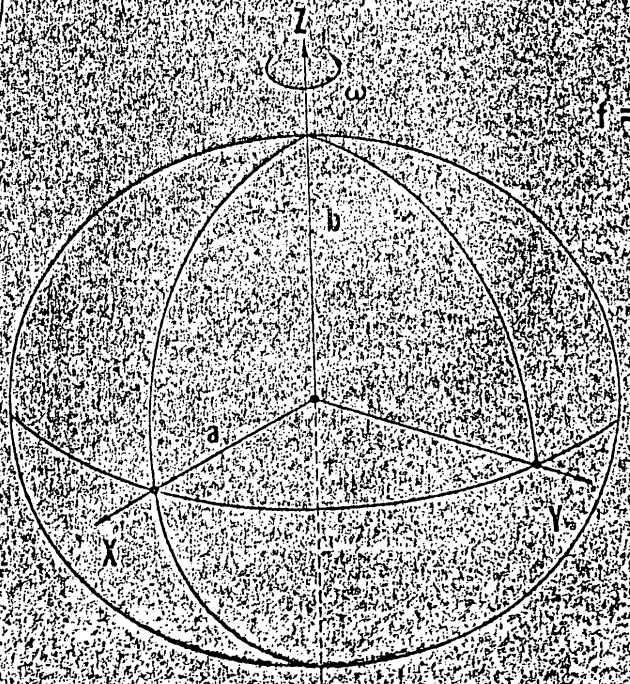
THE

GEOMETRIC (MATHEMATICAL) FIGURE OF THE EARTH

ELLIPSOID OF REVOLUTION



ELLIPSE ROTATED AROUND MINOR AXIS GENERATES AN ELLIPSOID



$$f = \frac{a-b}{a}$$

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REFERENCE ELLIPSOID CONSTANTS

REFERENCE ELLIPSOIDS	a (Meters)	f
CLARKE 1866	6378206.4	1/294.9786982
CLARKE 1880	6378249.145	1/293.465
INTERNATIONAL	6378388	1/297
BESSEL	6377397.155	1/299.1528128
EVEREST	6377276.345	1/300.8017
MODIFIED EVEREST	6377304.063	1/300.8017
AUSTRALIAN NATIONAL	6378160	1/298.25
SOUTH AMERICAN 1969	6378160	1/298.25
AIRY	6377563.396	1/299.3249646
MODIFIED AIRY	6377340.189	1/299.3249646
HOUGH	6378270	1/297
FISCHER 1960 (SOUTH ASIA)	6378155	1/298.3
FISCHER 1960 (MERCURY)	6378166	1/298.3
FISCHER 1968	6378150	1/298.3
WGS 60	6378165	1/298.3
WGS 66	6378145	1/298.25
WGS 72	6378135	1/298.26
WGS 84*	6378137	1/298.257222101

* PRELIMINARY

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TABLE

DEFINING PARAMETERS*
FOR
THE WGS 84 ELLIPSOID

PARAMETERS	NOTATION	VALUE
SEMIMAJOR AXIS	a	6378137 m
SECOND DEGREE ZONAL HARMONIC COEFFICIENT OF THE GEOPOTENTIAL	$\bar{C}_{2,0}$	$-484.16685\,4896 \times 10^{-6}$
ANGULAR VELOCITY OF THE EARTH	ω	7292115×10^{-11} rad s^{-1}
THE EARTH'S GRAVITATIONAL CONSTANT**	GM	3986005×10^{8} m^{3} s^{-2}

*PRELIMINARY (GPS 80 VALUES)
** INCLUDES THE MASS OF THE EARTH'S ATMOSPHERE

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TABLE

DIFFERENCES

-WGS 72 AND WGS 84* ELLIPSOID PARAMETERS-

IPSOID PARAMETERS	NOTATION	WGS 72	WGS 84*	DIFFERENCE**
IMAJOR AXIS	a	6378135 m	6378137 m	2m
TTENING	f	1/298.26	1/298.257222101	0.3122701×10^{-7}
ULAR VELOCITY	ω	$7292115.147 \times 10^{-11}$ rad s^{-1}	7292115×10^{-11} rad s^{-1}	-0.147×10^{-11} rad s^{-1}
OND DEGREE ZONAL	$C_{2,0}$	-484.1605×10^{-6}	$-484.166854896 \times 10^{-6}$	$-0.006354896 \times 10^{-6}$
VITATIONAL CON-NT SS OF EARTH'S OSPHERE INCLUDED)	GM	3986008×10^{8} m^3 s^{-2}	3986005×10^{8} m^3 s^{-2}	-3×10^{8} m^3 s^{-2}
VITATIONAL CON-NT THOUT MASS OF TH'S ATMOSPHERE)	GM'	3986005×10^{8} m^3 s^{-2}	No Value	--

STIMATED (THESE ARE GRS 80 VALUES)

GS 84 MINUS WGS 72

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WGS 84

EARTH GRAVITATIONAL MODEL(S)

THE GEOPOTENTIAL

$$U = \frac{GM}{r}\left[1 + \sum_{n=2}^{\infty}\sum_{m=0}^{n}\left(\frac{a}{r}\right)^n \left(C_{n,m}\cos m\lambda + S_{n,m}\sin m\lambda\right) P_{n,m}(\sin\phi')\right]$$

GM = EARTH'S GRAVITATIONAL CONSTANT

a = SEMIMAJOR AXIS (OF THE ELLIPSOID)

r = RADIAL (GEOCENTRIC) DISTANCE (TO THE CALCULATION POINT)

n,m = DEGREE AND ORDER

ϕ', λ = GEOCENTRIC LATITUDE, GEOCENTRIC LONGITUDE

$P_{n,m}(\sin\phi')$ = NORMALIZED ASSOCIATED LEGENDRE FUNCTION

$C_{n,m}$, $S_{n,m}$ = NORMALIZED GEOPOTENTIAL COEFFICIENTS

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WGS 72
EARTH GRAVITATIONAL MODEL

DEGREE AND ORDER		NORMALIZED GEOPOTENTIAL COEFFICIENTS	
n	m	$\bar{C}_{n,m}$	$\bar{S}_{n,m}$
2	0	-484.1605×10^{-6}	
2	1	...	...
2	2	2.4423×10^{-6}	-1.4035×10^{-6}
3	0	9.5958×10^{-7}	
3	1	2.0536×10^{-6}	2.6703×10^{-7}
...	...		
8	8		
...	...		
12	12		
...	...		
19	19		
...	...		
28	27		

TOTAL COEFFICIENTS = 473

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COMBINATION OF DATA TYPES

-PROVIDE IMPROVED DEFINITION OF EARTH'S GRAVITATIONAL FIELD-

- MEAN GRAVITY ANOMALIES

- GEOID HEIGHTS

- GROUND-BASED SATELLITE TRACKING DATA

-- DOPPLER

-- LASER

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SURFACE GRAVITY

DATA

GRAVITY FIELD REPRESENTATION

MEAN GRAVITY ANOMALIES FOR SURFACE ELEMENTS

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DOD GRAVITY LIBRARY
HOLDINGS (JAN 83)

- POINT GRAVITY ANOMALIES	10,865,781*
- MEAN GRAVITY ANOMALIES	
$1^{o} \times 1^{o}$	53,767
$5^{o} \times 5^{o}$	2,429

* AUTOMATED FILES

ALTIMETRIC

GEOID HEIGHTS

Declassified in Part - Sanitized Copy Approved for Release 2013/12/19 : CIA-RDP85M00158R000900060065-8

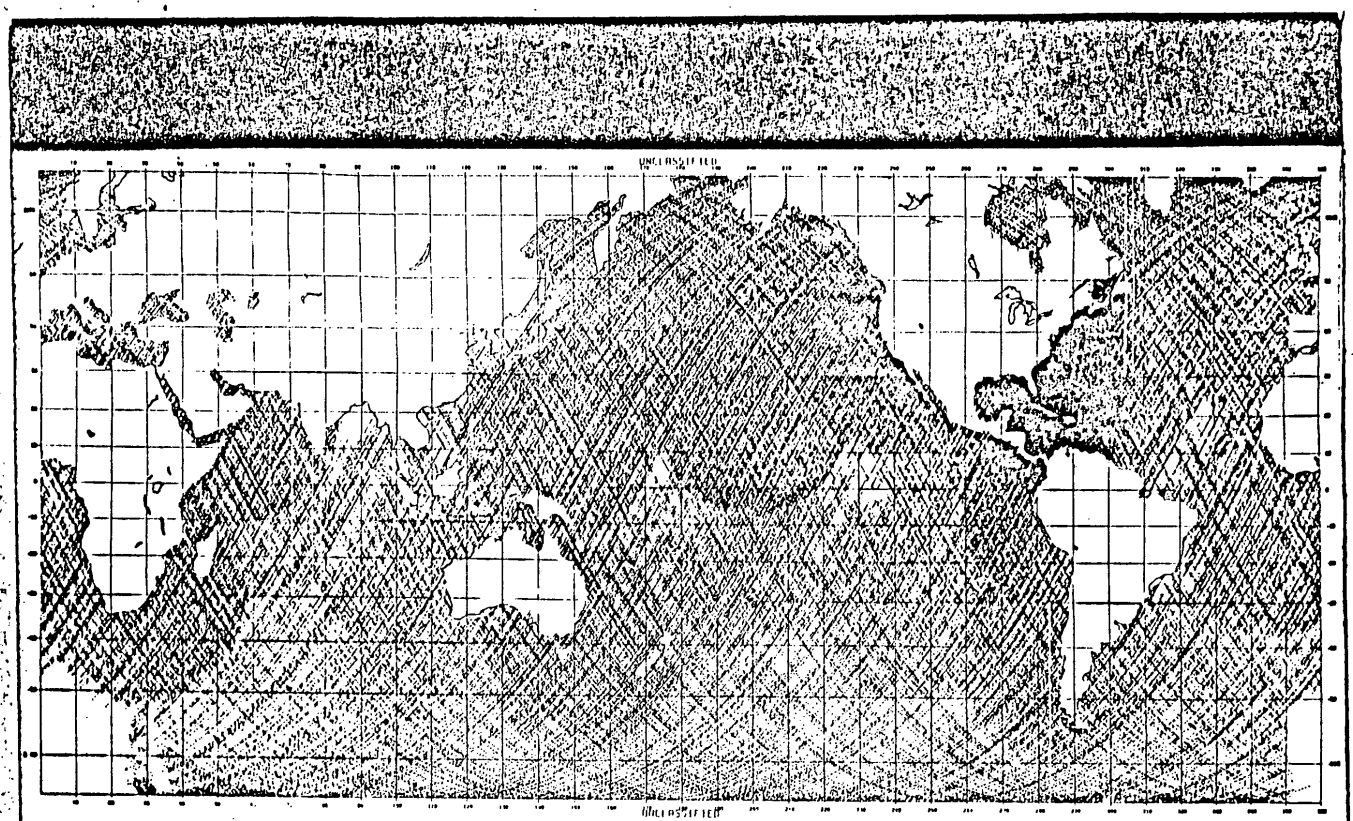

FIGURE. DOD HOLDINGS GEOS-3 ALONG TRACK GEOID HEIGHTS (3,646,422 VALUES)
(MARCH 1981; EVERY 9TH VALUE PLOTTED)

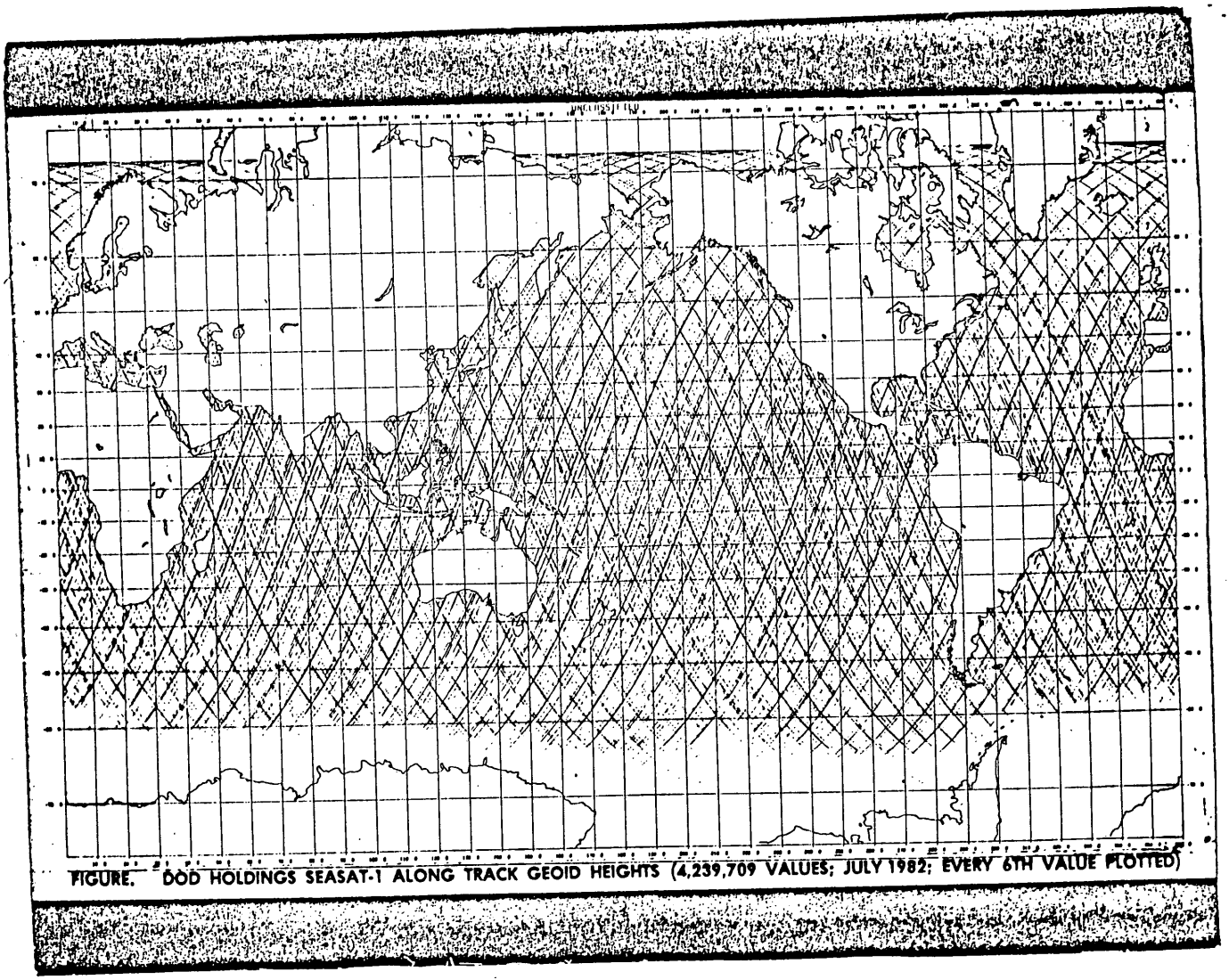

FIGURE. DOD HOLDINGS SEASAT-1 ALONG TRACK GEOID HEIGHTS (4,239,709 VALUES; JULY 1982; EVERY 6TH VALUE PLOTTED)

WGS 72 VERSUS WGS 84
-EARTH GRAVITATIONAL MODELS-

WGS 72 (CHARACTERIZED BY)	WGS 84* (CHARACTERIZED BY)
- ONE GENERAL PURPOSE MODEL, A SPHERICAL HARMONIC EXPANSION OF THE GEOPOTENTIAL (COMPLETE THROUGH n=m=19, SELECTED COEFFICIENTS THROUGH n=28, m=27) FOR ALL APPLICATIONS. - USED IN TRUNCATED FORM (n=m=8), SUPPLEMENTED BY LAUNCH AREA RESIDUAL POINT MASS SETS, WITH MINUTEMAN II, III. - USED IN TRUNCATED FORM (n=m=9) WITH TRIDENT I. - CONSISTS OF 473 COEFFICIENTS. - UNCLASSIFIED THROUGH n=m=12.	- ONE GENERAL PURPOSE MODEL, A SPHERICAL HARMONIC EXPANSION OF THE GEOPOTENTIAL, COMPLETE THROUGH AT LEAST n=m=41, PLUS ANY SPECIAL PURPOSE MODELS REQUIRED TO SATISFY KNOWN OR ANTICIPATED DOD APPLICATIONS. - DATA TAPES -- A RELATED WORLDWIDE POINT MASS SET. -- A RELATED WORLDWIDE MEAN GRAVITY ANOMALY FIELD -- A RELATED WORLDWIDE GRIDDED SET OF GRAVITATIONAL FIELD COMPONENTS AT VARIOUS ALTITUDES - ALGORITHM(S) AND DATA TAPES FOR COMPENSATING FOR THE EFFECT OF GRAVITY ON AIRCRAFT INS PERFORMANCE.

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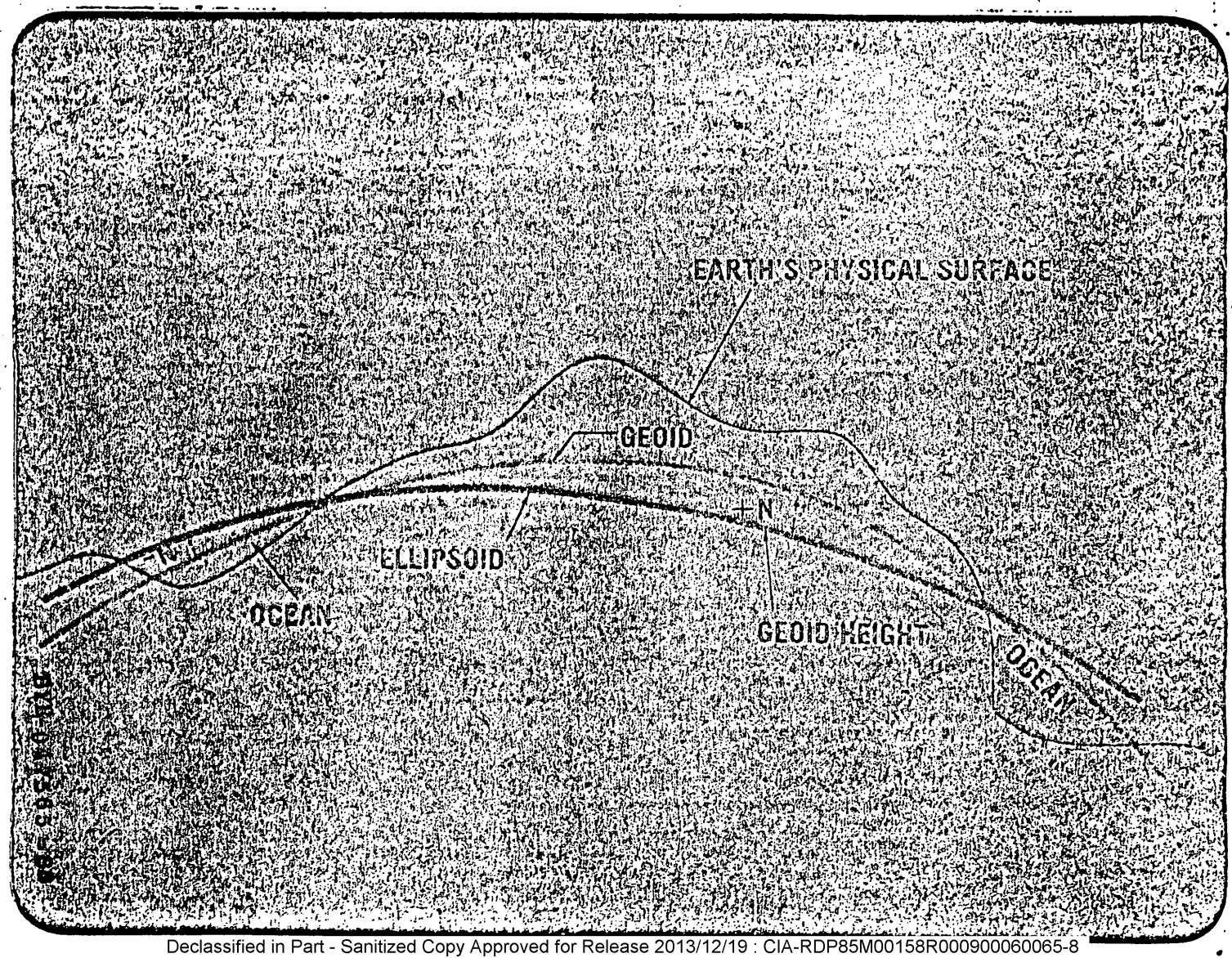
WGS 84 GEOID

THE GEOID

- THAT PARTICULAR EQUIPOTENTIAL SURFACE OF THE EARTH THAT COINCIDES WITH MEAN SEA LEVEL OVER THE OCEANS AND EXTENDS HYPOTHETICALLY BENEATH ALL LAND SURFACES.

- IN A MATHEMATICAL SENSE, IT IS DEFINED AS SO MANY METERS ABOVE (+N) OR BELOW (-N) THE ELLIPSOID.



WGS 72

WORLDWIDE GEOID

$$N = R \sum_{n=2}^{n_{max}} \sum_{m=0}^{n} (\bar{C}_{n,m} \cos m\lambda + \bar{S}_{n,m} \sin m\lambda) \bar{P}_{n,m} (\sin \phi')$$

WGS 72
EARTH GRAVITATIONAL MODEL

DEGREE AND ORDER		NORMALIZED GEOPOTENTIAL COEFFICIENTS	
n	m	$\bar{C}_{n,m}$	$\bar{S}_{n,m}$
2	0	-484.1605×10^{-6}	
2	1	...	...
2	2	2.4423×10^{-6}	-1.4036×10^{-6}
3	0	9.5958×10^{-7}	
3	1	2.0536×10^{-6}	2.6703×10^{-7}
...	...		
8	8		
...	...		
12	12		
...	...		
19	19		
...	...		
28	27		

TOTAL COEFFICIENTS = 473

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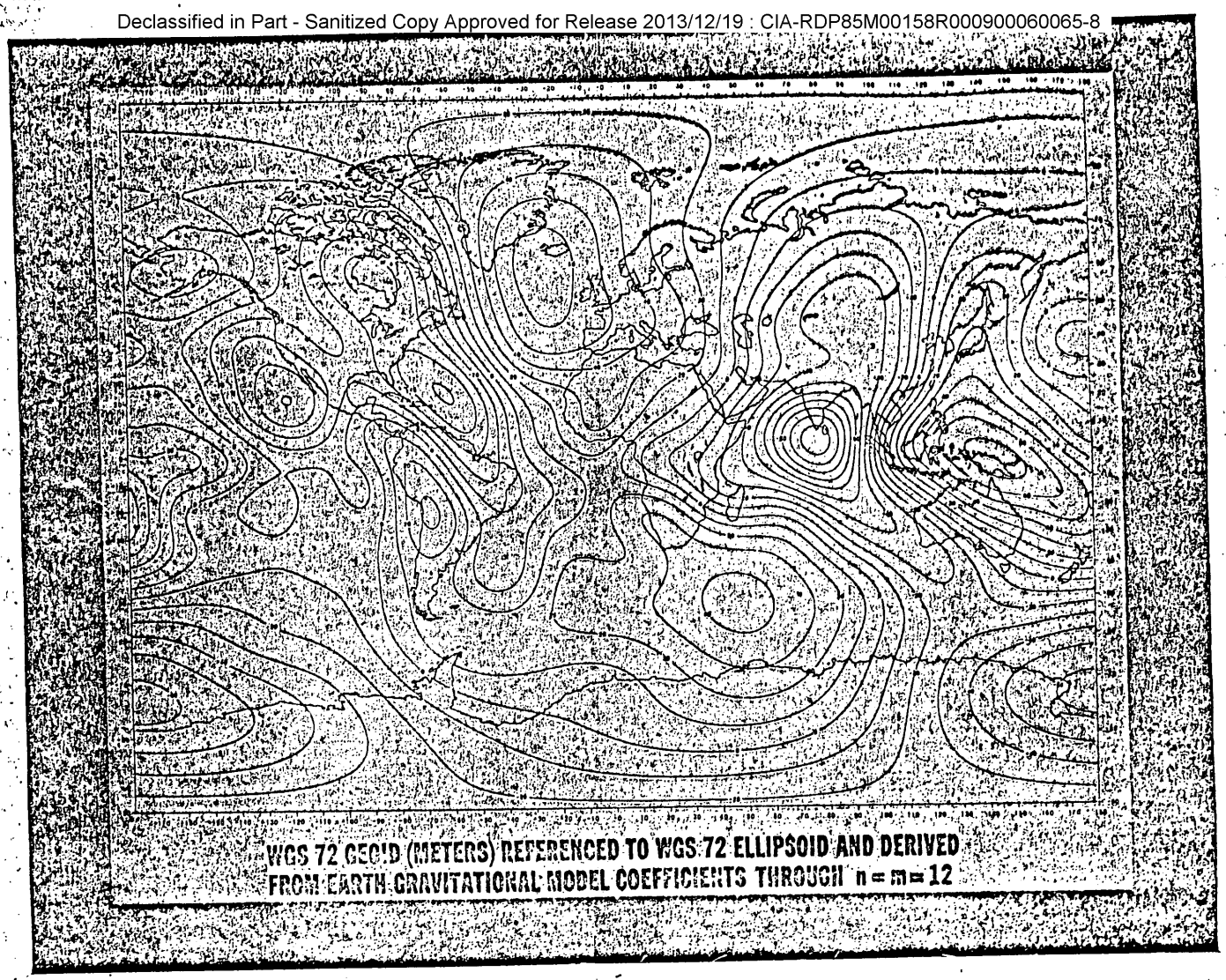

WGS 72 GEOID (METERS) REFERENCED TO WGS 72 ELLIPSOID AND DERIVED FROM EARTH GRAVITATIONAL MODEL COEFFICIENTS THROUGH n = m = 12

worldwide 1° [illegible]
RMS DIFF

WGS 72 VERSUS WGS 84

-GEOIDS-

WGS 72 (CHARACTERIZED BY)	WGS 84* (CHARACTERIZED BY)
-A SPHERICAL HARMONIC EXPANSION UTILIZING THE WGS 72 BGM THROUGH n=28, m=27. ALSO DEPICTED IN CONTOUR CHART FORM.	-A SPHERICAL HARMONIC EXPANSION THROUGH n=m=? ALSO DEPICTED IN CONTOUR CHART FORM.
-AN ASTROGEODETIC GEOID HEIGHT CONTOUR CHART (LAND AREAS)	-A WORLDWIDE $1^{o}x1^{o}$ GRID OF VALUES, COMPOSITELY FORMED, AND MADE AVAILABLE: -- AS A DATA TAPE. -- IN CONTOUR CHART FORM.
-USED AS A $10^{o}x10^{o}$ GRID IN NAVSTAR GPS USER EQUIPMENT AND IN NAVSTAR GEODETIC RECEIVERS TO SUPPORT THE DETERMINATION OF h=H-N	-USED IN MULTIPLE REGRESSION EQUATION FORM IN NAVSTAR GPS USER EQUIPMENT AND IN NAVSTAR GEODETIC RECEIVERS TO SUPPORT THE DETERMINATION OF h=H-N
-ACCURACY (1σ)	-ACCURACY (1σ) -- OCEAN = ± 2 TO ± 3 m -- LAND = ± 2 TO ± 5 m

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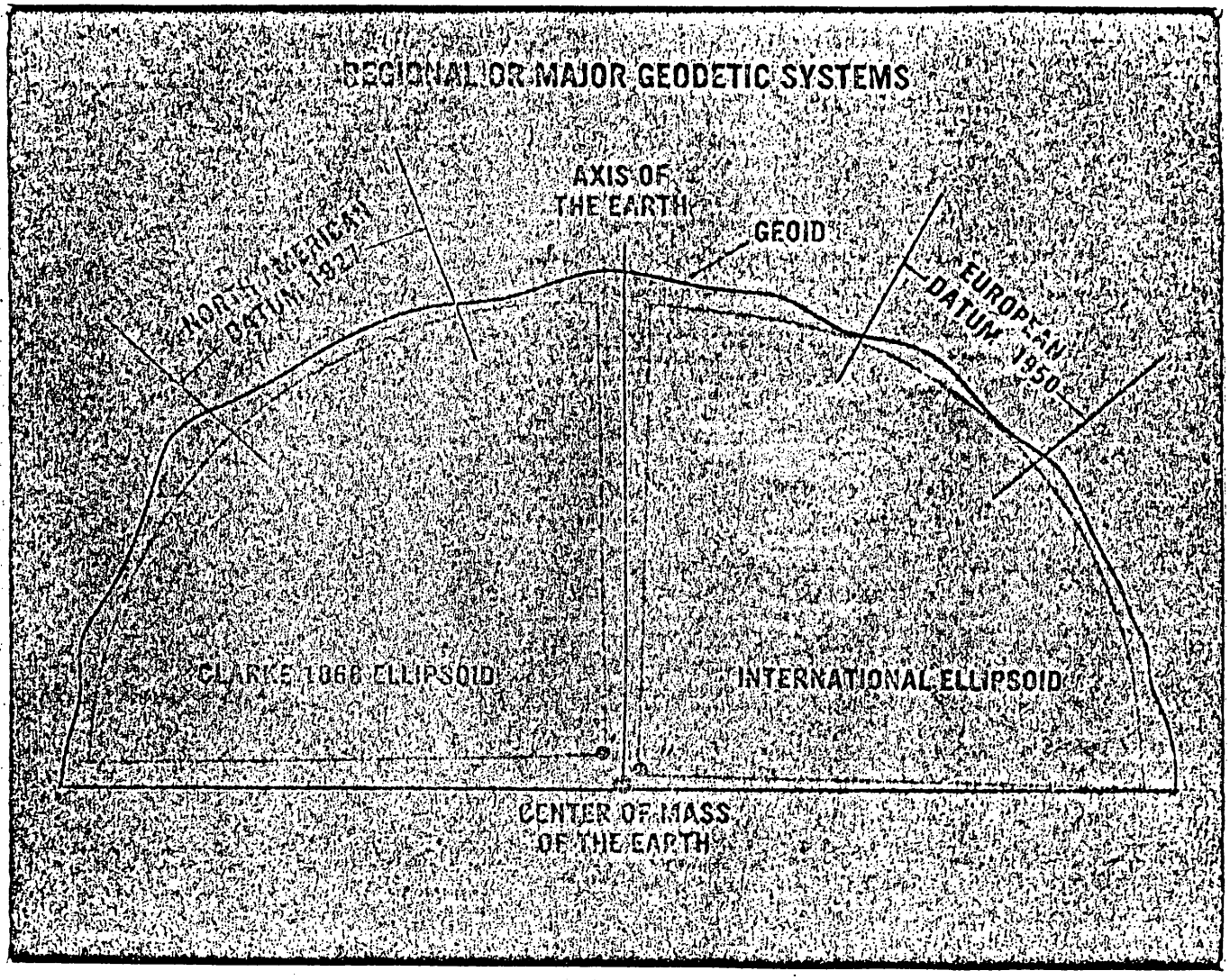
* PRELIMINARY

LOCAL GEODETIC-TO-WGS 84

DATUM SHIFTS



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THE ABRIDGED MOLODENSKY FORMULAS

$$\Delta\phi'' = \frac{1}{M}\left[-\Delta X \sin\phi\cos\lambda - \Delta Y \sin\phi\sin\lambda + \Delta Z \cos\phi + (a\Delta f + f\Delta a)\sin 2\phi\right] + \left[R_M \sin 1''\right]$$

$$\Delta\lambda'' = \frac{1}{N\cos\phi}\left[-\Delta X \sin\lambda + \Delta Y \cos\lambda\right] + \left[R_N \cos\phi \sin 1''\right]$$

$$\Delta H = -\Delta X \cos\phi\cos\lambda - \Delta Y \cos\phi\sin\lambda - \Delta Z \sin\phi + (a\Delta f + f\Delta a)\sin^2\phi - \Delta a$$

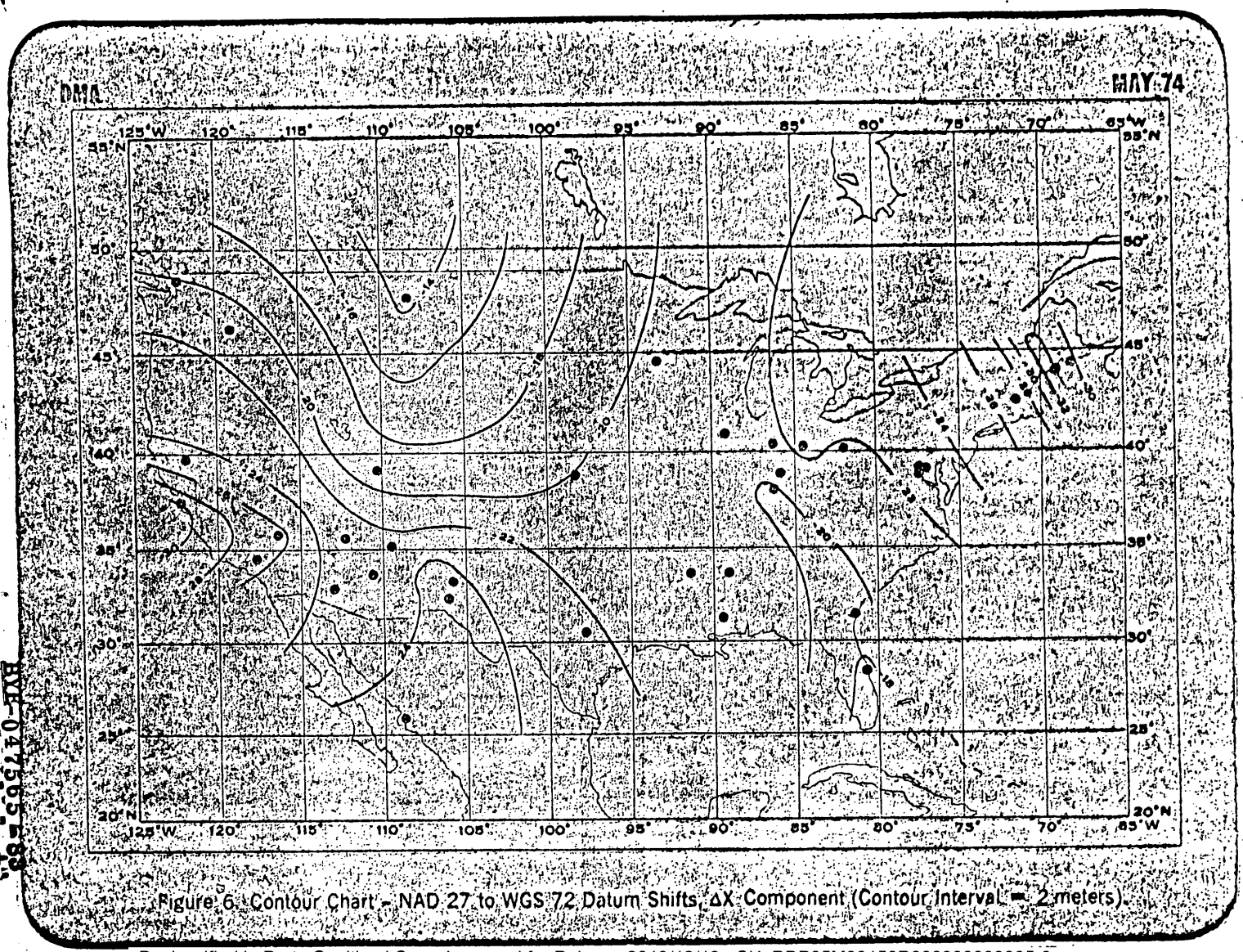
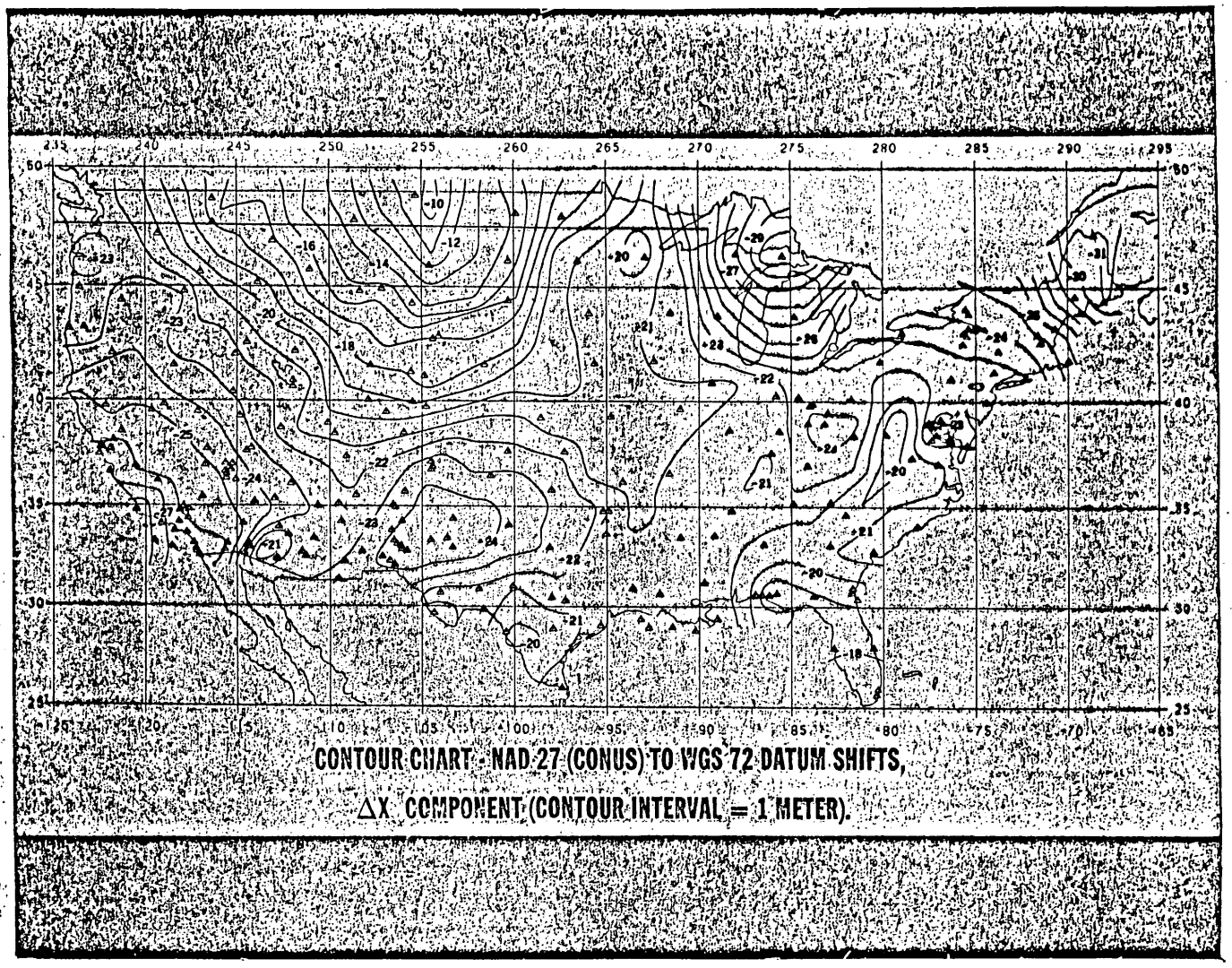


Figure 6. Contour Chart - NAD 27 to WGS 72 Datum Shifts, ΔX Component (Contour Interval = 2 meters)



CONTOUR CHART - NAD 27 (CONUS) TO WGS 72 DATUM SHIFTS,

ΔX COMPONENT (CONTOUR INTERVAL = 1 METER).

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WGS 72 VERSUS WGS 84

-DATUM TRANSFORMATIONS-

WGS 72 (CHARACTERIZED BY)	WGS 84 * (CHARACTERIZED BY)
LOCAL GEODETIC-TO-WGS 72 DATUM (COORDINATE) TRANSFORMATION FORMULAS 1. STANDARD MOLODENSKY FORMULAS 2. ABRIDGED MOLODENSKY FORMULAS	LOCAL GEODETIC-TO-WGS 84 DATUM (COORDINATE) TRANSFORMATION FORMULAS 1. STANDARD MOLODENSKY FORMULAS 2. RECOMMEND ABRIDGED MOLODENSKY FORMULAS NOT BE USED 3. MULTIPLE REGRESSION EQUATION ($\Delta\phi, \Delta\lambda, \Delta H$) FORM; SUITABLE FOR REAL TIME USE 4. INVESTIGATING VALUE OF 7-PARAMETER FORM (3 TRANSLATIONS, 3 ROTATIONS, 1 SCALE) FOR SOME DATUMS VERSUS A 3-PARAMETER FORM (3 TRANSLATIONS) WGS 84-TO-LOCAL GEODETIC SYSTEM DATUM (COORDINATE) TRANSFORMATION FORMULAS MULTIPLE REGRESSION EQUATION ($\Delta\phi, \Delta\lambda, \Delta H$) FORM; SUITABLE FOR REAL TIME USE
LOCAL GEODETIC-TO-WGS 72 DATUM SHIFTS 1. SET OF MEAN ΔX, ΔY, ΔZ VALUES FOR 19 DATUMS, 4 WITH DATUM COMPONENTS** 2. SET OF ΔX, ΔY, ΔZ CONTOUR CHARTS ONLY FOR NAD 27 (CONTIGUOUS UNITED STATES)	LOCAL GEODETIC-TO-WGS 84 DATUM SHIFTS 1. SET OF MEAN ΔX, ΔY, ΔZ VALUES FOR 62 DATUMS, 9 WITH DATUM COMPONENTS** 2. SET OF ΔX, ΔY, ΔZ CONTOUR CHARTS FOR 19 LOCAL GEODETIC SYSTEMS 3. SET OF $\Delta\phi, \Delta\lambda, \Delta H$ CONTOUR CHARTS FOR 19 LOCAL GEODETIC SYSTEMS

BXE-04756 2 83

* TENTATIVE (INVESTIGATIONS STILL CONTINUING)

ACCURACY VALUES*

FOR

WGS 84 PARAMETERS, DATA, PRODUCTS

* TO BE DETERMINED

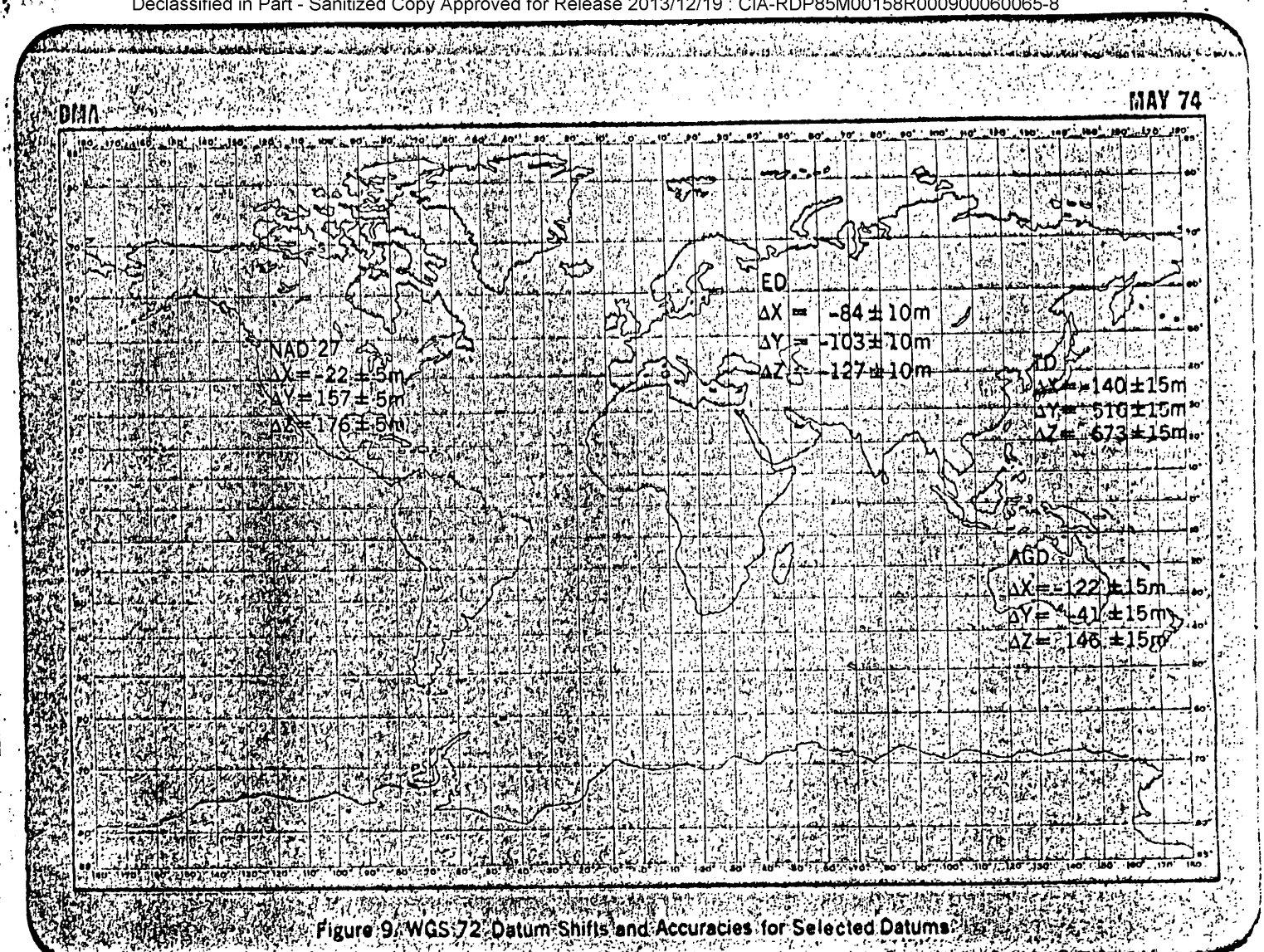


Figure 9. WGS 72 Datum Shifts and Accuracies for Selected Datums

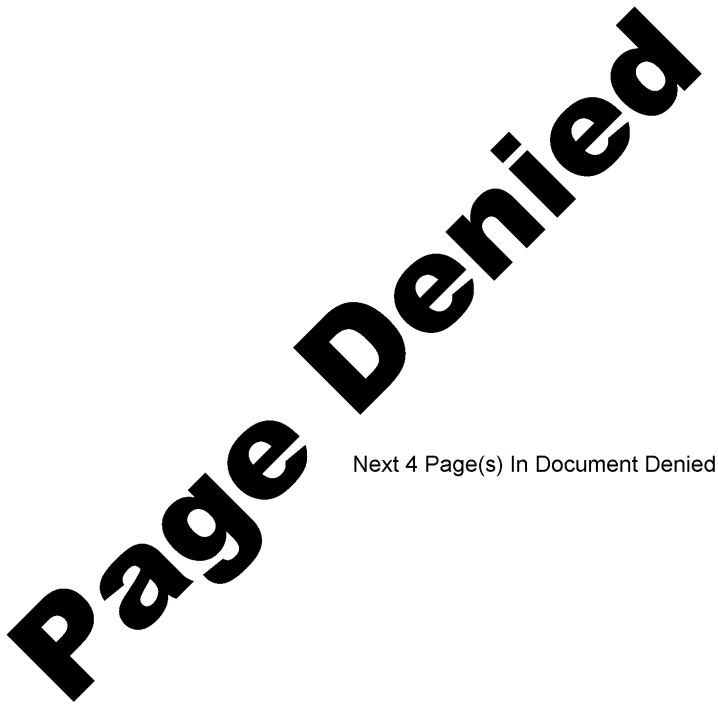
BYE-047565-88

SUMMARY

SUMMARY

- WGS 84 WILL BE AVAILABLE 31 DECEMBER 1984.
- DMA PLANS TO PRODUCE MC&G DATA/PRODUCTS ON WGS 84 BEGINNING IN CALENDAR YEAR-TBR
- SOME MC&G DATA/PRODUCTS WILL BE UNAFFECTED BY WGS 84, NEEDING ONLY TO BE RELABELED.
- DMA WILL WORK CLOSELY WITH USERS OF MC&G DATA/PRODUCTS TO RESOLVE SCHEDULE AND CONVERSION COST PROBLEMS.
- IF NECESSARY, DMA WILL MAINTAIN AN MC&G ITEM ON BOTH WGS 72 AND WGS 84 FOR A BRIEF PERIOD OF TIME.

METRIC PAN CAMERA SYSTEM



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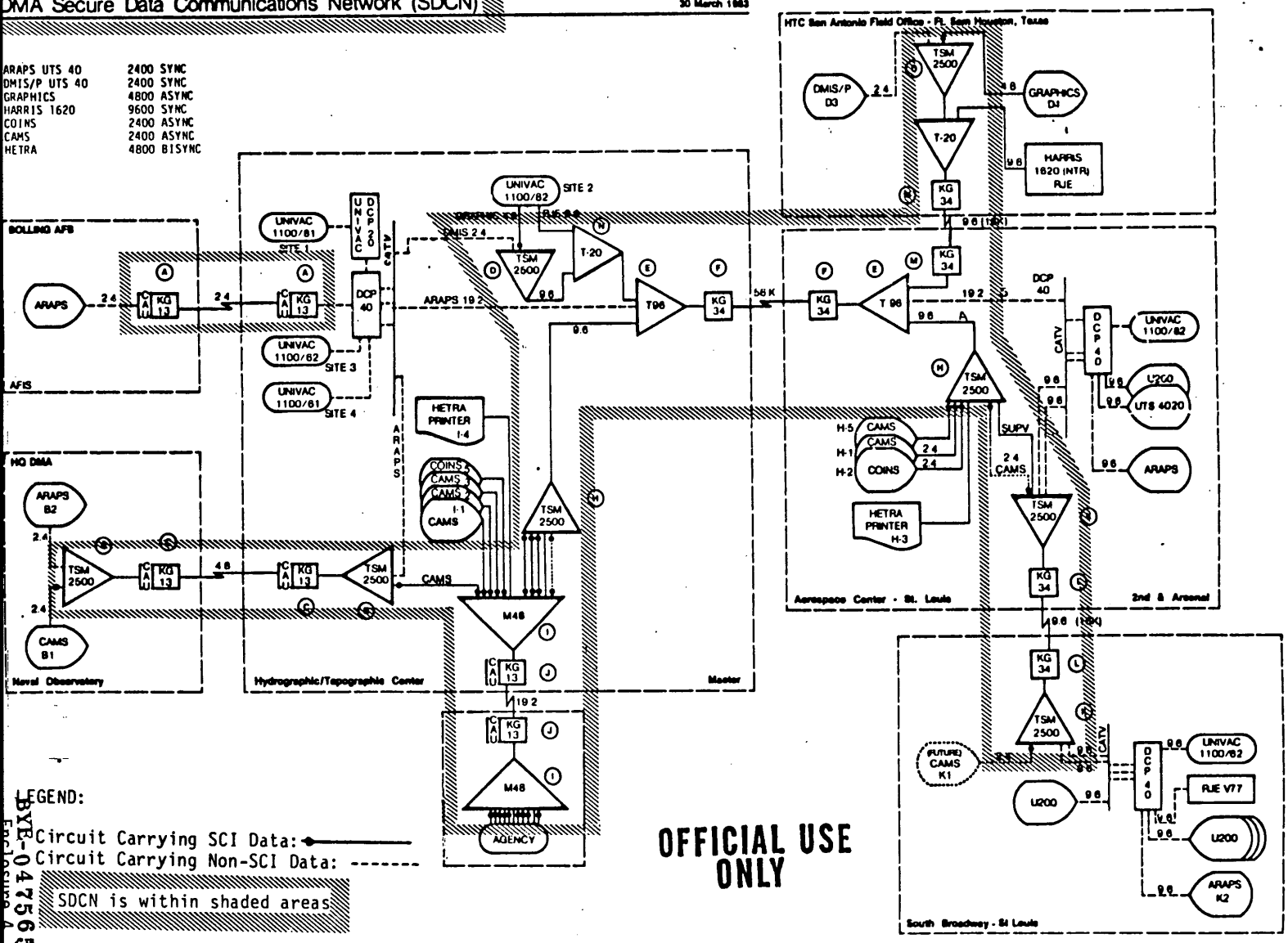
DMA Secure Data Communications Network (SDCN)

30 March 1983

ARAPS UTS 40	2400 SYNC
DMIS/P UTS 40	2400 SYNC
GRAPHICS	4800 ASYNC
HARRIS 1620	9600 SYNC
COINS	2400 ASYNC
CAMS	2400 ASYNC
HETRA	4800 BISYNC



LEGEND:

Circuit Carrying SCI Data: ———

Circuit Carrying Non-SCI Data: - - - - - - -

SDCN is within shaded areas

OFFICIAL USE ONLY

BYE-047565

Enclosure 4

12 August 1983

SDCN SCHEDULE

ACTION	ORIGINAL	AS OF 5JUL83	AS OF 21JUL83	AS OF 26JUL83	AS OF 9AUG83 *
EQUIPMENT ON HAND **	15 JUL 83	1 SEP 83	1 SEP 83	26 AUG 83	26 AUG 83
TIMPLX EQUIP					6 OCT 83
START INSTALLATION	18 JUL 83	7 SEP 83	7 SEP 83	7 SEP 83	19 SEP 83
56 KB LINE	5 AUG 83	19 SEP 83	29 AUG 83	29 AUG 83	23 SEP 83
OTHER CIRCUITS			19 SEP 83	19 SEP 83	11 OCT 83
COMPLETE HTC/AC INSTALLATION	5 AUG 83	28 SEP 83	28 SEP 83	28 SEP 83	7-14 OCT 83
COMPLETE INSTALLATION					

** EDD TO HTC

S. THOMPKINS
C. WALTERS
S. SOSTMAN
* R. COOK

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